

A Comparative Analysis of Effects of Firms' Strategic Factors on Performance in Nigeria.

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ABSTRACT

The effects of firms' resources and idiosyncrasies and overall industries characteristics on performance differentials in Nigeria are not well known. How industries shape their interactions as exhibited by resources and performance has not yet been proven empirically using Nigerian evidences. Consequently, this study was carried out to compare the effects of firms' strategic factors on their overall performance in Nigerian manufacturing sectors.

A descriptive design was comprised of 30 listed firms cutting across 8 manufacturing sectors over a time period of 5 years, and was analyzed using the panel regressions technique. It was found that similarities existed in directions of the firms' strategic factors and returns on invested capital relationship though the magnitudes of effects differed marginally across disaggregated data for manufacturing companies in Nigeria. In conclusion, firm strategic factors had effects on returns on invested capital but were uninfluenced by characteristics of industries. Therefore, decision makers should, irrespective of the peculiarity of the competitive environment, prioritize a resource based view to strategy.

(Key terms: business resources, strategy, firms, manufacturing, competition)

INTRODUCTION

Resource-base writers are well persuaded that firms' idiosyncrasies - intangible assets, offer superior explanatory value for performance differentials irrespective of sectors (Barney, 2001). But Porter's (1980) 'five forces' theory, an offshoot of earlier industrial organization views, maintain that the firm is a theoretical 'black box' and impervious to aiding understanding about

observable performance differences among firms. However, it is still debated as to what causes performance differentials among firms operating in similar industries in Nigeria.

Firms operating within the wider industry configuration (Porter, 1998) deploy strategies to fit with the ever changing external environment. The primary significance of strategy is sustenance of firms' relevance to all its stakeholders as well as guaranteeing a future unlike relying on serendipity or a no strategy approach. Crafted strategies reflect decision makers' preferences for either internal or external factors. Are industries' characteristics moderating tendencies in the interaction of firms' strategic factors and their performance?

The foregoing logics hold significance to Nigeria's manufacturing industries which comprise 119 firms classified into 16 distinct competitive arenas (Adamade, 2014). The nations' industrial base is failing to meet local needs for products as evidenced by enormous strategic opportunities deficits. The comparative disadvantage this portends is, against the backdrop of massive customers' base, natural resource base as well as human resources potentials that are left under-utilized.

Comparing firms' effects on performance differentials has attracted research attention elsewhere (see Hawawinni, Subramanian and Verdin, 2001). In our context, not much work has been done on reducing the unknowns about how the industry moderates the firms' strategic factors and performance linkages.

This research paper attempts a convergence of the two extreme strategy research frameworks by examining the effect of controlling for industry characteristics in the *a priori* relationship between

internal strategic factors and performance of Nigeria's manufacturing industries.

REVIEW OF RELATED LITERATURE

Conceptual Framework

Strategy and performance are linked inextricably (Hills and Jones, 2008; Prasad, 2010; Prevos, 2005). According to Kazmi (2008), institutionalized strategy processes curtail business failures that due to difficult to manipulate external and market structure forces. Indeed, the performance claim (Prevos 2005) of management supports strategy formulation and implementation as critical elements of high performance and wedge against ruinous economic shocks and downturns.

The firm is a combination of resources and capabilities (Ural and Acaravci, 2006). Resources are the physical, financial, human, organizational, and location advantages owned or accessed by the firm. Capabilities are the unique routines, procedures, and processes developed and applied in resources utilization and combinations (Kazmi, 2008). Strategy weaved around a firm's resource and capability combinations engender synergy and leverages strengths for sustainable competitive advantage. Tendencies in this regards find expressions in strategy practices like *Kaizen* or continuous improvements (Rogovsky and Talentino, 2010).

The resources and capabilities underlie sustainable competitive advantages when characterized as valuable, rare and non-substitutable (Peteraf, 1998; Barney, 2001; Hills and Jones, 2008). Contemporaneous views, however, align to the concept of dynamic capabilities in conformity with portends of the market deterministic framework. Along this line, Teece (2007) posits that decision makers' choices to capture advantages in intangible assets are crucial micro foundations for performance variations especially in dynamic situations.

According to Hills and Jones (2009), economies of scale, experience curves, and learning advantages of large-sized firms are generated through extensive interactions in products and factors networks with other players in respective markets and segments. Therefore, while each firm is potentially fit to grow, the characteristics of its industrial environment is another stretch of the determinants of performance at the firm-level.

Umoh (2007), identifies firms which are indistinguishable industrial delineations as continuums of products, skills, technologies, and markets. Difference in products and services are classifiers for industries and each firm is in a products-markets mix. For example, a firm producing tangible items is likely to be a manufacturer serving households, individuals, or other firms with consumables, domestic appliances, or partially finished products requiring further processing. Service-oriented firms are providers of intangible outputs used by individuals, households or other firms and businesses.

However, all firms that are predominantly tangibles-producers operate a narrow range of service activities to smooth their operations and independence (Hills and Jones, 2008; Rogovsky and Talentino, 2010). For example, a firm's periphery or service activities may be the provision of after-sales services to buyers of its primary products. HRM (Human Resources Management), general management, and finances functions of a firm are support services for the primary activities.

The key role of strategy in any firm is as a tool for outwitting rivals and preventing new entrants from gaining access into the market. Firms employ strategy as mechanisms in conjunctions with others or solely to acquire strategic advantage on a sustainable basis. Barney and Wright (1997) submit that strategy difference rather than parity is the basis for sustainable competitive advantage. But competitive collaboration is emerging as a viable option for strengthening prospects for survival against the odds of stiff-necked and mutually destructive nature of unbridled competition. Strategic action involves the allocation of existing resources and the development of new ones to achieve the long term goals or objectives of the firm (Mauri and Michaels, 1998). New resources and capabilities include the tendencies to network, forge alliances and harness the advantages of joint ventures to tap common industry advantages.

Strategic factors include assets, resources, capabilities, strategic industry factors, and the macro-variables. They are perceived as the elements, inputs, and components on which the effectiveness of the strategy processes rests (Kazmi, 2008; David 2008; Wheelen and Hunger, 2008).

Strategy scholars link several variables within and outside firm boundaries with performance and strategy. In the strategy process, these factors are assessed and measured in terms of availability, magnitude, impact, locations, sources and scope. The internality and externality of strategic factors are the basis of theoretical and empirical divergence in strategy.

Theoretical Framework

According to Bharadwaj (2000), the resource-based view is the dominant theoretical perspective in strategic management literature. Firms are held in this theory to differ in strategic factors, in strategy and are heterogeneous in performance. Resources, synergies, capabilities, competences, competitive advantage and performance all form the basis for Resource Based View evaluation of the varying performance of the firm.

Effectiveness and efficiency of firms depend on the quality and quantity of the resources including human, organizational, capital resources and the location of the firm. The ability of firms to leverage on organizational skills and to integrate capabilities is what underlies the performance differential of high performers from low performers.

While market structure determinism, the principal notion of the industrial organization theorists, hinges on the components of the competitive environment including force of rivalry, bargaining powers of buyers and of suppliers; technology and potential entrants, the resource based view focused strategic management scholars and practices on the configuration of resources; and capabilities as predictor of the firm-environment fit. The thrust of the resource based view is that the internal strategic environment which is within the control and manipulation of managers can be leveraged or stretched to weather the storm of the vagaries inherent in the external environment.

Each firm effect is said to impact on the level of performance of the firm. In this study, this reality is of essence. The effect of quality human factors is different from that arising from technology and capital. Effects created by the culture and value system of the organization equally differs from those that emanate from the functions of marketing, research and development, finances and embedded trust level in the organization. The

relevance of the resource-based frameworks stems from its applicability to separate and to the combined effects whereby it is possible to measure and to predict the effect of human resources management capabilities, branding capabilities, innovation and change capabilities, manufacturing capabilities on strategy and performance. It is also possible to examine the broader perspective of how combinations of capabilities impact on the level of firm performance.

The economic, as well as the organizational models of performance, are applicable within the resource-based framework. Although rationality is of the economic component of the resource-based view evaluation of performance, heuristics, complexity, and indeterminacy forms the core of the organizational component. Therefore, a superior theoretical underpinning is provided by the resource-based view.

The value of combining rationality and subjectivity to the scientific enterprise is fostered. As it relates to human behavior in strategy process elements of illogicality are imminent. The unpredictability of human behavior is encapsulated in the organizational model of performance. The element of serendipity (Clegg, Kornberger, Pitsis, 2005) or luck (Prevos, 2005) in explaining the outcomes of strategy process and contents are therefore adequately reflected. In order words, that the strategy process is curvilinear or not neatly and orderly linked to performance is a desideratum of the resource based view of strategic management.

The theory holds that the firm is not a 'black-box' in terms of evaluating its performance (i.e. its performance does not depend on the structure and characteristics of the industry). It opposes the view that the distinct and relative position of firms to each other accounts for performance differentials (Porter, 1981). The opposite framework to the foregoing focuses on the demand-side, analyzing the factor market, expected cost of inputs as determinants of profitability and economic rents (Schmalensee, 1985).

Furthermore, the resource-based view of strategic management explains that economic performance, value added and creation of firms functionally relate to the type, magnitude, nature, accumulation, development, deployment, recycling and concentration of a firms' resources

and capabilities (also called firm assets). Key propositions of the RBV include:

1. firms differ in resource endowment and heterogeneity with which they generate performance differentials;
2. the different resources and capabilities of the firms characterized as valuable, rare and inimitability are the basis of superior performance; and;
3. when isolating or protective mechanisms are erected around strategic firm assets, the superior performance of the firm is made persistent lasting a significant duration (Amit and Schoemaker, 1993 and Berman, Down and Hill, 2002).

Barney (1991) aptly summarizes the view by stating that 'a firm which possesses a valuable and rare resource which it obtained in a uniquely historical circumstance can gain sustained competitive advantage'. In conceptual terms, resources and capabilities are valuable or not valuable, rare or in abundance, and inimitability or substitutable.

Empirical Framework

Several studies done to validate or refute claims of both the resource-based claim and the industrial organization theory have returned inconclusive verdicts. Schmalensee (1985); Hansen and Wernerfelt (1989); Rumelt (1991); Mauri and Michaels (1998); and Brush, Bromiley and Hendrickx (1999) embarked on varied studies to substantiate the resource base claims. Berman, Down and Hill (2002) validated the RBV in an empirical examination of tacit knowledge at team-level.

Loderer and Waelchli (2009) studied a specific firm strategic factors link with performance (i.e., age). It was found that aging firms suffered performance impairment on a progressive scale. Evans (1987) found that firms grow at rates which decrease with age at a diminishing pace. On the contrary, Dunne, Roberts and Samuelson (1989) had taken the view that firm life expectancy increased with age as only better firms survive (Baker and Kennedy, 2002). Pastor and Veronesi (2003) reported that profitability and market-to-book ratios decline with firm age, related to investors learning and falling uncertainty.

Hawawinni, Subramanian and Verdin (2001) empirically studied the effects of outliers, that is, leading and the worst performing firms in industries to verify the resource based view. They concluded that the performance of outlier firms significantly impacted on the theoretical veracity of the resource based view.

Several of the previous works were analyses of variance (ANOVA) or variance component analyses (i.e., descriptive statistical models on correlations of dependent and independent variables, respectively). Mauri and Michael (1998) highlighted the advantage of variance component model. It does not require further analyses of inferential statistics. This is because ANOVA leads to attaining objectives of studies of estimation of the relative magnitude of the different effects without further tests of significance.

METHODOLOGY

The *a priori* expectation is that relationships between firm strategic factors and the returns on invested capital would differ along industries of the selected firms.

The design used is *ex post facto*. It involved parametric measure of cross-sectional and time series relationship between firm strategic factors and performance. The cross-section comprised thirty public listed manufacturing firms over a time span of five years (2003-2007). Variables included firm size, firm age and capital intensity

Hypothesis

The hypothesis for the study in its null form is as follows:

Ho: there is no significant difference between effects of firm strategic factors on performance of manufacturing firms for different manufacturing sectors in Nigeria.

Measurements/Specifications

Proxies represented firm strategic factors, industrial characteristics and performance variables in the study (Hawawinni, Subramanian and Verdin, 2002 and Ural and Acaravci, 2006). Returns on invested capital (ROIC) was proxy for

performance in the study due to its ease of computation and wide acceptability in the literature. The variable was derived using the formula:

$$ROIC = NOPAT \div TA \quad (1)$$

Where NOPAT = Net Operating Profit after Tax
TA = Total Assets.

The firm strategic factors were represented by: firm size, firm age and capital intensity. Firm size was obtained mathematically as:

$$S = \log TA \quad (2)$$

Capital intensity reflects firm's leveraging of capital assets. In the characteristically rapid change and flexibility oriented environment defined by numerous technological innovations, firms' capability to accumulate and deploy modern capital assets is critical to performance differentials. With a view to satisfy the increasingly sophisticated customer-base and to enhance competitiveness, manufacturing firms are expanding ICT (information and communication technology) applications, integrating their production capabilities and automating systems. Engendering qualitative value chain relationships is key to strengthened capital resources deployment (Kazmi, 2008). Capital intensity was derived from the relationship between value of plants and equipment and total turn-over and C is its symbol in the model.

The age of a firm influences its attitude towards research and development, investments in new projects, and human resources development. It is assumed that firm age differences influence resources and capabilities deployed for strategizing which invariably predict ROIC over time.

Though old firms may have developed time test capability to wisely block new entrants and sustain first movers' advantage, new firms may have advantages of not being clobbered with untradeable resources (Barney, 1986). Inertia increases with age and older firms exhibit costly corporate governance behaviors (large board sizes) (Adamade and Gunu, 2013). Firm age was delineated by subtracting year of incorporation from each sequential year.

Population and Sample of Study

The 110 Nigerian quoted manufacturing firms, were categorized into 16 industrial sectors comprised the population in this study. Multi-stage sampling technique was used to generate a sample of 30 firms representing half the number of sectors. Time series period was 5 years made up of 2003-2007 (inclusive). The sampling frame was the listed manufacturing firms and their sectors.

The sectors in the study include breweries, conglomerates, food, beverages, tobacco, building materials, pharmaceuticals, industrial and domestic products, chemicals and paints, and agro-allied.

Data Collection

Secondary data was collected from the relevant years' published financial statements of the firms in the dataset.

Data Analysis

Descriptive statistics of mean and standard deviation were applied in deriving values of firm size, firm age and capital intensities of the subjects. The hypothesis was tested with the aid of regressions analysis for the thirty firms and for industry characteristics dummy variables were employed in the OLS (Ordinary Least Squares) estimations. The decision rule followed was accept null hypothesis if calculated value shows significant effects on the OLS, otherwise do not accept. Correlations of the dependent and independent variables were assessed too. To identify industries effects on the dependent variable, equation 3 was used thus:

$$ROIC_{it} = \beta_0 + \beta_1 D1 + \beta_2 D2 + \dots + \beta_9 D8 + \beta_{10} S_{it} + \beta_{11} C_{it} + \beta_{12} A_{it} + \epsilon_{it} \quad (3)$$

Where $D1, \dots, D8$ = industries dummies (binary variables takes values 1 or 0 respectively) in the model and represent the 8 sectors.

$i = 1, \dots, 30$ are the firms

$t = 1, \dots, 5$ represents the time

S= size

C= capital intensities

A= age of each firm

FINDINGS

The correlations coefficient of the study is shown in Table 1. It shows a mixed grill and even spread of the relationship between firm strategic factors and returns on invested capital for sectors (i.e., four positive and four negative were recorded for S and ROIC relationships). The sectors with positive relationships include breweries; construction; industrial and domestic products; and packaging. Other were negative (i.e., automobiles/tires; pharmaceuticals; food, beverages and tobacco; and agro-allied). Only packaging industries recorded positive relationship between C and ROIC. Industries with positive A and ROIC relationship include industrial and domestic products; food, beverages and tobacco; and agro-allied.

The result of regression for the composite model which served as benchmark for comparison of magnitudes for each sector is presented in Table 2. It was found that all independent variables were significantly related to returns on invested capital, though only in the case of firm size was the relationship positive.

The coefficients of regressions, related standard errors, significance levels, constant for the models and numbers of observations in each sector are presented in Table 2. Brewery sector findings appear consistent with the composite model (Table 3). Its magnitude for firm size was higher. It indicated that approximately 11% of the variation in the changes in returns on invested capital was explained firm sizes.

This was significant, supporting acceptance of Ho specific to the sector ($p < 5\%$). Though capital intensity fell within acceptance region ($p < 5\%$), it had a negative sign of coefficient. R^2 value was higher than the composite model.

For the construction sector, size again was found to be significant at $p < 10$ and coefficient value 3.07%. The value of effect is less here than in the composite data. Capital intensity had a significant, strong and positive effect on returns on invested capital with 12.8%. Firm age showed strong but negative impact on returns on invested capital (12.87%).

Table 1: Correlations Coefficient for Dependent and Independent Variables for Sectors in Distribution.

Sector	Size	Capital intensity	Age
Brewery	0.3478	-0.1763	-0.1427
Construction	0.3514	-0.0016	-0.8568
Industrial & Domestic Products	0.1806	0.0055	-0.2245
Automobiles & Tires	-0.4833	-0.5421	-0.3986
Pharmaceuticals	-0.0231	-0.3154	-0.4989
Food/Beverage/Tobacco	-0.0807	0.1869	-0.5972
Packaging	0.1901	-0.3141	0.1210
Agro-allied product	-0.5923	0.5867	-0.4972

Source: Researcher's compilation, 2014

Table 2: Result of the Composite Model's Regression of Firm Strategic Factors on Returns on Invested Capital.

Variables	Coefficient	Standard error	Probabilities
Size	0.0518423	0.0185121	0.005
Capital Intensity	-0.150639	0.0368786	0.000
Age	-0.1692041	0.1016987	0.096
Const.	0.07091880	0.1999606	
R-sq	0.126		

Source: Researcher's compilation, 2014

Table 3: Results for Regression of Firm Strategic Factors on returns on Invested Capital Disaggregated to Sectors.

Var.	Brew	Const-n	Ind/dmst	Auto/tires	Pharmac	FBT	Pckging.	Agro-allied
Size	0.359 ** (0.1456)	0.0492** (0.0182)	0.0461** (0.0192)	0.0528*** (0.018)	0.053** (0.0188)	0.0574** (0.0414)	0.0515** (0.0188)	0.051** (0.084)
Capital	-0.3273** (0.1581)	0.2065*** (0.0426)	-0.152*** (0.0369)	-0.147*** (0.0371)	-0.15*** (0.0370)	-0.155*** (0.0210)	-0.1506*** (0.037)	-0.150*** (0.018)
Age	0.285 (0.344)	-0.2069*** (0.1005)	-0.1612 (0.1019)	-0.1727** (0.1018)	-0.161 (0.1058)	-0.156 (0.0381)	-0.1685 (0.1024)	-0.168 (0.1020)
Const	-2.3249 (1.1783)	-1.141 (0.1966)	0.099 (0.2015)	-0.0647 (0.2003)	-0.0511 (0.2139)	-0.026 (0.1043)	-0.0709 (0.2006)	-0.075 (0.2001)
R ²	0.3079	0.162	0.1331	0.1302	0.1265	0.1279	0.1261	0.1266
No of obs	20	15	15	20	30	35	10	5

*, ** and *** indicates significance at the 90%, 95% and 99% levels respectively.
Source: Researcher's Compilation, 2014

The model for the construction industry was relatively similar to the brewery model though its error term was 71.15%. Firm size retained positive and significant effects on returns on invested capital in this sector with magnitude of effect however less than those of the earlier models and $p < 5\%$. Capital intensity and age were negative in their effects. R^2 was higher than the value recorded for the composite model. The calculated coefficient for size of the industrial and domestic products sector is 10.04%. Its sign is positive and falls within acceptance region. However, capital intensity and age had high but negative coefficients (33.2% and 35.1%, respectively).

The regression model for the automobiles/tires sector showed slight difference with that of the previous. However size was significant as in the composite model. The value of R^2 for the model was better than for the composite model. For the automobiles and tire sector, all coefficients were within acceptance regions. Size which had a positive coefficient had its value as 12.09%. Capital intensity had its coefficient as 33.62% and age's coefficient was 39.49%. The unexplained variable was calculated as 15%.

The result for pharmaceutical sector showed consistency with the composite and the other models on the positive relationship of firm size with returns on invested capital. The signs or direction of capital intensity and age of the firms in relation to returns on invested capital are similar with those of the composite model. Its R^2 value is only marginally higher than the result for the

composite model. For food, beverages and tobacco sector, R^2 value is 12.79% which is only slightly higher than the composite value. However in magnitude and direction, size retains its feature in relation with returns on invested capital for the sector. The magnitude of capital intensity and firm age relative to returns was equally different from the composite model. The sign of the relationships were the same as in the original (composite) model.

For packaging sector which comprises of two firms in the data set, result shows that size is a determinant of returns on invested capital in the packaging sector. The larger the firm size the better was its influence on returns on invested capital for the period covered. However capital intensities and firm age related in similar manner with returns on invested capital as in the composite data. And the R^2 value was similar to that of the composite model at 12.61%.

The result for agro-allied sector is presented also in 4.10 reflected semblances with the composite model result in terms of firm size and returns; and in terms of R^2 value. Its $R^2 = 12.66\%$ is only slightly higher than that of the composite.

The summary indicating direction of regressions of FSF on ROIC is presented in Table 4.

Table 4: Summary of Directions of Regressions of FSF on ROIC for Various Models.

Models	Firm size	Capital intensity	Age
Composite	+	-	-
Breweries	+	-	+
Construction	+	+	-
Auto/Tires	+	-	-
Pharmaceuticals	+	-	-
Food/Beverages/Tobacco	+	-	-
Packaging	+	-	-
Agro-allied	+	-	-

Source: Researcher's compilation, 2014.

The table shows that in two sectors (brewery and construction), the direction of relationships between firm strategic factors and returns on invested capital were different from the composite's result. While the composite data showed negative relationship between capital intensity and returns on invested capital the result pertaining to the construction sector was positive in this parameter.

The result for age was negative in the composite but positive in the restricted case of the breweries sector. Ho is accepted with regards to firm size for the eight sectors. With regards to seven sectors covered in the study, Ho is accepted for capital intensity. However it is not accepted with regards to the construction sector. And Ho is not accepted with regards to firm age for the brewery sector. Otherwise, Ho is accepted for the other sectors

DISCUSSION OF FINDINGS

The finding in this study that ROIC varies along with firm size across the eight disaggregated data sets and in the composite dataset suggest the prominence of market power as underlying profitability (Hills and Jones, 2008). Across the eight industries covered, the larger the firm size, the higher the returns and of course vice versa (Ural and Acaravci, 2006). Market power is found to imply boost to strategic competitiveness and increasing returns to scale which arises from spread of fixed cost components over increasing units of outputs. Thinning off effect of cost per unit sustains an asymptotic cost curve which translates to opportunities for firms to increase resources allocations for improved quality, better after-sales-services and differentiation both in markets and products dimensions (Hills and Jones, 2008; Bhattacharyya and Saxena 2009).

Furthermore, as firms specializing implies a niche orientation associated with the 'giant killers' phenomenon, this results suggests the core competency approach to strategy (Prahalad and Hamel, 1993; Utomi, 1998) may be gaining ascendancy. The findings rebuts claims that large sized organization are cluttered due to sunk costs, rising overheads and overall operational efficiency, but supports the logic of aging as a debilitation against stakeholders' interests of profitability growth and improved spending on workers' rewards (Loderer and Waelchli, 2009). The prominence of common directions of causality in all the variables portrays consistency of these effects across the sectors for which the same set of competitive tools and methods may be deemed appropriate regardless of industry specificity.

Antiquation of capital assets such as equipment and production technology including managerial practices (though not obvious from this study) as an effect on profitability is evidenced. Lastly, the comparison of effects across eight industrial sectors embedded a novelty element into a study of this nature (Hawawinni, Subramanian and Verdin, 2002).

CONCLUSION AND RECOMMENDATION

Firm strategic factors have dissimilar effects on ROIC and this study has proved this to be similar across industrial sectors. That is, in the various sectors modelled, sizes of firms influence returns on invested capital positively, capital intensity, and age of firms. On the other hand influence returns on invested capital negatively. When firms increase their resource base through enlargements of resources, they tend to be creating conditions that would trigger rises in the ROIC on the other hand as the firms' age, their

capabilities degenerate or suffer value impairment which induces declined profitability over time. Similarly, it is deemed that more capital assets cause loss of profitability which can be due to absence of modernity in the choice of capital assets used for production. The effect of firm strategic factors on returns on invested capital therefore does not respond to industry characteristics.

It is therefore recommended that manufacturing firms management should inculcate a resource based approach to strategy by paying attention to organizational resources (size and age) and capital resources (capital intensity) formation and deployment so as to increase the profitability of the firms and enhance stakeholders' benefits.

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